

See table

Abstract

A testing system useful for food products employs a multispecies testing array to test for presence or amount of a plurality of organisms in a sample by detecting characteristic sequences. A data processing module reads the array to form a multispecies distribution output, and this is processed to provide trend, warning or other data. Using look-up or correlation, preferably in conjunction with data mining, the processing module produces information relating to taste, smell, texture, processing conditions, quality or source of a component or ingredient, potential pathogenicity or other factor. A single test thus provides quantitative and qualitative information about entire populations of microbial species in a tested sample, and the utility of the output distribution adds significant value to microbial testing. Correlation between microbial profiles and ingredient quality, flavor potential, and the likelihood of carrying otherwise undetectable or difficult to detect organisms allow process parameters to be changed or improved to address the identified conditions. The system provides correlations on a multidimensional space yielding new preconditions or warning indications, and provides a mechanism for specialization of the species distribution data for specific products, as well as for incorporation or development of process changes and company trade secrets. The array testing and processing sequence may involve culture multiplication, nucleic acid extraction, PCR amplification, labeling of targets and hybridization to the probe matrix array, followed by fluorescence detection and image analysis, to provide information on the presence and/or distribution of a specific group of organisms. The system is readily adapted to include new or proprietary DNA probes, assays or markers that are specific to the organisms, processes and materials of interest. The arrays may be configured with different species and gene sequences to effect clinical or diagnostic testing, workplace or environmental testing, and may be applied to other situations in which the determination of multispecies distributions solves for a diagnostic, corrective or analytic intervention.

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